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ABSTRACT

As part of an effort to meet the specific educational needs of local business and industry, a cooperative educational renewal program was developed between Carroll Technical Institute (CTI) in Carrollton, Georgia, and the Southwire Company, a local producer of aluminum and copper materials. A thorough training needs assessment was conducted and, due to the classified nature of Southwire's manufacturing processes, CTI's involvement was limited to areas from basic literacy skills through front-line supervision. Critical job tasks were identified and analyzed to determine how competent workers use literacy skill applications in their jobs and a group of diagnostic tests were administered. The results indicated a serious deficiency in basic academic skills. As a solution the research program included three district components: workplace literacy, secretarial training, and an Applied Manufacturing Technology (AMT) diploma program in supervision. The workplace literacy component, taught on the CTI campus, was designed to raise the literacy level of Southwire employees to improve their job performance and has served 254 employees since 1987. The secretarial certification program was designed to increase the skill levels of Southwire secretaries who could not demonstrate an acceptable level of competence on the exemption test. It has resulted in reports of improved productivity, reduced absenteeism, and higher morale within secretarial staff. The AMT program consists of a core of general academic courses, selected fundamental technical courses, and academic credit for related work experience. (MAB)

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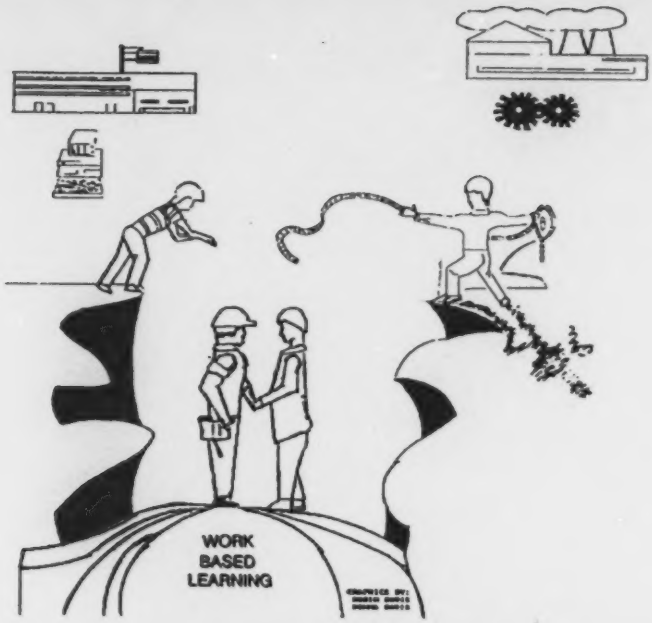

CARROLL TECHNICAL INSTITUTE AND SOUTHWIRE COMPANY'S EDUCATIONAL RENEWAL PROGRAM

Presented to:

Participants in the Workforce 2000 Roundtable Conference

Sponsored by the League for Innovation in the Community College

February 1, 1994
New Orleans, Louisiana

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Preface

Research consistently supports that business productivity and efficiency, as well as the degree of practiced job safety, is positively correlated to the amount of related training received by employees. Training occurs in many forms. Pre-employment technical training, entry level training, on-the-job training, college courses, vo-tech courses, private professional trainers, in-house supervisors, and professional associations/organizations are the most common.

The past decade has resulted in advanced technologies and increased competition, both domestic and foreign, forcing companies to demand a higher degree of product quality and, consequently, a higher degree of technical skill from their workers. For the first time this century, a significant proportion of the current work force is at risk of becoming technologically illiterate, with an insufficient number of jobs to absorb those who are less skilled.

The immediate concern for many companies is the dilemma of how to reward and retain loyal, dependable employees who find themselves victims of these higher demands for technological skills. Most employees are unable to pursue full-time re-training programs to up-date their skills, and, tragically, some have a poor basic skill foundation on which to build more complex problem solving skills and technical knowledge which is needed to continue their employment.

The need for a skilled work force will require that government, business, and education cooperate to build trust in a system that can work to overcome the perceived skills gap in technical occupations. One of the challenges for education may be to offer an innovative, yet practical approach to bridge this gap. One such method is work-based learning. This concept is not new. It was popular in early American craft training programs and is still used in several industrialized nations today, notably Japan and Germany.

The U.S. Department of Labor's Employment and Training Administration in November, 1989, issued a report entitled, "Work-Based Learning: Training America's Workers." In this report it was stated that "a growing body of evidence points to formal workplace training as one solution to the skills gap." It further reports that comparative studies of OJT education and training in such countries as Japan and West Germany indicate that this work-based approach has advantages in producing a skilled and flexible work force.

Educational pedagogy supports experiential learning. Experiments where experiential learning has been used have consistently resulted in positive results. Research suggests that performance on a trial work assignment is more than twice as accurate a forecaster of how well a candidate will do on the job than is academic performance--i.e. grades and degrees earned. The superiority of experiential learning over classroom instruction alone strongly suggests that continuing education--including employee training--should be expanded and integrated into work assignments and long-term career development.

Despite the considerable benefits of work-based training programs, private investment in training has been limited. The most common form of employee training is informal. Much less frequent is a more structured method of training. According to the Bureau of Labor Statistics, only about 10 per cent of U.S. employees receive any formal qualifying training from their employers. The total estimated employer expenditure for formal training is less than 2 per cent of payroll expense.

A second major challenge for education will be how to get employers to make the needed investment in quality training for their workers. This challenge is especially important when education time-lags, employee instability, and the focus of business for immediate profitability are considered.

In its 1989 report, Made In America, the MIT Commission on Industrial Productivity concluded that, "without major changes in the ways that schools and firms train workers over the course of a life-time, no amount of macro-economic fine-tuning or technological innovation will be able to produce significantly improved economic performance and a rising standard of living." The need and expectations for training are coming. Will we as technical educators be ready?

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Carroll Technical Institute
Carrollton, Georgia

Introduction and Overview

NEED FOR EDUCATIONAL RENEWAL

As the year 2000 approaches, many companies are taking steps to ensure that their work force will be prepared for the technological changes of the next century. It will be necessary that companies achieve a world class status to compete in a global economy. With about 85% of the work force for the year 2000 already on the job and the technology for the year 2000 still largely on the drawing board, employees everywhere will have to continue to learn new skills throughout their careers.

EDUCATIONAL RENEWAL PROGRAM PARTNERS

Carroll Technical Institute is a state post-secondary institution, accredited by the Southern Association of Colleges and Schools (SACS). Carroll Tech offers 22 diploma programs, 13 certificate programs and 7 Associate Degree programs in Applied Technology. Carroll Tech also offers students such services as career planning, counseling, financial aid, job placement, developmental studies, adult literacy classes, child care, and a referral system for other community resources. The institution's Business/Industry Services Division, along with the Instructional Services Division are actively involved in designing and implementing programs to meet specific educational needs of our region's business and industry.

Southwire Company is the largest U.S. producer of aluminum and copper rod, wire, and cable used for transmitting and distributing electricity. It is the only producer in the world with its own aluminum smelter and copper refineries. Annual sales are well over one billion dollars. As an example of the extent of Southwire's business, one third of all new American houses are wired with Southwire products. Southwire has located five plants in Carrollton, employing about 2800 people and own 8 other plants throughout the nation located from Utah to South Carolina.

THE EDUCATIONAL RENEWAL PROGRAM

Southwire Company, being fully aware of the current revolution in the workplace, is committed to implementing Total Quality Management methods in achieving its goals and to compete favorably far into the 21st century. As a result, a cooperative agreement was reached whereby a thorough training needs assessment was conducted throughout Southwire's five Carrollton plants at all levels of the organization. The scope of Carroll Tech's involvement was identified as limited to basic literacy skills through front-line supervision due to the classified nature of Southwire's manufacturing process. Critical job tasks that the company and workers determine to be of high priority were identified and analyzed to determine how competent workers use literacy skill applications in their performance. A group of diagnostic and exemption tests were identified/developed for the purpose of measuring the beginning level of competence skill for

Southwire's workforce. The results of early testing indicated that there was a serious deficiency in basic academic skills. From the results of testing and job task analysis, a process of placing priority on this data resulted in three distinct components of the educational renewal program: workplace literacy, secretarial training, and an Applied Manufacturing Technology diploma program in supervision.

WORKPLACE LITERACY

The purpose of the workplace literacy component of the Southwire Educational Renewal Program is to raise the literacy level of Southwire employees to allow each to improve the literacy skills needed to improve their job performance, train for additional job opportunities, and gain literacy skills necessary to learn the technology needed to make Southwire a world class manufacturer. The workplace literacy component (Adult Basic Education) enables all employees in all five plants, working all shift schedules, to participate. Job literacy training is provided on the Carroll Tech campus, located within 3 miles of all 5 plant sites. The project provides classes for employees functioning on grade levels 0-12. As employees gain literacy skills, they are placed in training programs to up-grade their technical skills they will need to function in more technological environments.

Four new learning labs have been established for literacy classes and are open Monday through Thursdays from 1:00 in the afternoon to 10:30 at night to accommodate the work schedules of employees

in all five plants. Students are provided 60 hours of instruction in a 10 week period. The establishment of three grade specific lab programs enables instruction to match the learner's ability. A classroom lab was opened for Level I, 0-4 grade level, Level II, 5-8 grade level, and Level III, 9-12 grade level. A computer lab to service literacy levels 0-12 is also available. The curriculum includes standard adult education materials and curriculum designed to meet requirements of specific job situations. Books and materials are provided for students both in class and on a check-out basis. Currently, there are 2 lead teachers, 4 part-time teachers and 2 aides funded by Southwire, but employed by Carroll Tech, who provide literacy education to 180 Southwire employees who need these services. From our experience, the following principles were used to develop a successful program.

* Supported by company management
* Individualized to accommodate a variety of needs/abilities
* Convenient location and schedule
* Non-threatening
* Voluntary and open to all
* Linked to business goals
* Economical

In addition, the curriculum should have the following elements.

* Have clearly defined goals and objectives
* Teaching materials/tasks must apply to workers' jobs
* Build on workers' knowledge of job content

* Provide frequent feedback to trainees
* Provide a high level of personal involvement by teacher
* Provide pre and post-testing to evaluate learning

The company has reported greater productivity and job performance, more regular attendance, punctuality, and better communication between management and employees. Carroll Technical Institute has benefitted from having developed a workplace literacy program that can be duplicated by others and has contributed directly to the improved literacy of the local community while supporting local business/industry. The students enrolled will be better able to perform their jobs, be able to train others using effective written and oral communications, will have the skills necessary to train for other job openings, and will be literate citizens of their community. Successful involvement in this program will also encourage students to enroll in other, more advanced, educational courses. One hundred eighty employees are currently enrolled, 254 employees have participated since 1987, and 14 employees have received GED's through the program.

SOUTHWIRE SECRETARIAL CERTIFICATION PROGRAM

Southwire Company has determined that an important factor in its total quality management concept is the establishment of professional competence standards within its secretarial and clerical support staff. As a result of the training needs assessment process described earlier, it was determined that a comprehensive secretarial training program, customized to company needs, was important to standardize the clerical skills of all secretarial personnel. Recognizing that a large percentage of Southwire's secretarial and clerical support staff already demonstrate many of the required competencies on a daily basis, it was considered necessary that some means be developed for identifying and exempting those with advanced skills from applicable sections of the comprehensive training program.

Therefore, a detailed listing of specific secretarial skills was developed by Carroll Tech. This list was given to Southwire training officers for the purpose of identifying those skills considered most important. From this list, an exemption test, consisting of both written and practical applications, was developed and approved by Southwire officers. This test was administered by Carroll Tech personnel to secretarial staff selected by Southwire. Those who demonstrated an acceptable level of competence in all areas will be exempted from all training sessions and immediately certified as a Level I Southwire secretary. For those who do not demonstrate an

acceptable level of competence on the exemption test, training sessions were planned to increase and/or standardize their skill levels prior to certification by Southwire.

Seventy-nine secretaries were tested for basic academic skills, secretarial proficiency, and microcomputer utilization skills. All secretarial/clerical support personnel have completed phase I training, which was required for all Southwire secretaries. Phase II allows for more advanced skills in office management, supervision, and microcomputer operations. This level is required for existing executive secretaries, and voluntary for those who complete phase I and want to be considered for promotion to executive level when vacancies occur. Phase III has been identified as the Certified Professional Secretary (CPS) credential sponsored by Professional Secretaries International. This phase is completely voluntary, however Southwire does support with financial assistance the decision of their executive level secretaries to pursue this credential.

Southwire reports improved productivity, less absentism/turnover, higher morale, and more cooperation within the secretarial staff. Equally important in a rapidly changing environment, is the acceptance of on-going training.

Target Employees

- Executive Secretaries
- Secretary I's
- Others With Over 50% Secretarial Duties

Secretarial Knowledge/Skills

Work Ethics
Grammar/Punctuation
Effective Communication
Proof Reading
Computer Literacy
Telephone Etiquette
General Office Management
Standard Filing Procedures
Typing Accuracy/Speed
Supply/Requistion Procedures

Certification Guidelines

Phase I

- All Target Employees Certify To Secretary I Level
- Mandatory For All Target Employees
- On Company Time, Company Expense

Certification Guidelines

Phase II

- All Executive Secretaries Certify To Executive Level
- Mandatory - On Company Time
- All Others Voluntarily Certify To Executive Level
- Own Time, At Company Expense

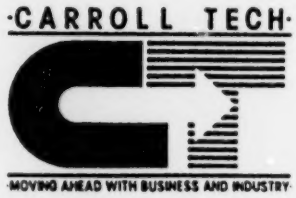
Certification Guidelines

Phase III

- All Employees Certified At Executive Level Voluntarily Pursue professional Secretary Certification
- Own Time, At Company Expense
- Higher Classification/Compensation

Work-Based Learning Program

Diploma in Applied Manufacturing Technology



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INTRODUCTION

The Work-Based Learning Program is a diploma program developed to offer businesses and industries, their employees, and other individuals an educational opportunity which will recognize successful work experience and provide further technical and academic course work. The program will consist of three parts:

1) a core of general academic courses
2) selected fundamental technical courses and
3) academic credit for related work experience

PHILOSOPHY

The basic beliefs, attitudes, and concepts that are the foundation of the Work-Based Learning Program are expressed in the following statements:

Work-Based Learning is a program of study which is compatible with the policies of the Georgia Board of Technical and Adult Education and encourages each Work-Based Learning Program student to benefit and contribute as a partner in the economic development and stability of Georgia. The philosophy of the Work-Based Learning Program is founded on the value attributed to individual students, specific occupational fields, and technical education.

The program structure acknowledges individual differences and respects the right of individuals to seek fulfillment of their physical, mental, social, educational, emotional, spiritual, and economic needs. The program does not discriminate on the basis of race, color, national origin, religion, sex, age, handicapping condition, academic disadvantage, or economic disadvantage.

The Work-Based Learning Program is consistent with the philosophy and purpose of the institution. The program provides academic foundations in communications, mathematics, and social science, as well as technical fundamentals. Program graduates are well trained in the underlying fundamentals of their respective field of study and are well prepared for upward mobility and/or cross training.

This program uses a variety of instructional modes and educational experiences to broaden the student's educational and occupational background. A major component of the program is the awarding of academic credit for successful related work experiences.

Business and industry demands are constantly changing and require that curricula utilize state-of-the-art equipment and technology to meet these requirements. The flexibility of the Work-Based Learning Program will accommodate these very specific needs of diverse companies.

PURPOSE

The purpose of the Work-Based Learning Program is to provide individuals an opportunity to obtain the knowledge, skills and attitudes necessary to succeed in specified occupational fields.

The Work-Based Learning Program provides educational opportunities regardless of race, color, national origin, religion, sex, age, handicapping condition, academic disadvantage, or economic disadvantage.

The Work-Based Learning Program is intended to produce graduates who are prepared for upward mobility or cross training in various occupational fields. The program acknowledges successful related work experience by rewarding academic credit for these experiences. Program graduates will demonstrate competency in their respective fields of study in areas such as use of state-of-the-art equipment and technology, occupational skills, and safety. These programs will be customized to different businesses and industries to ensure appropriate training. The customizing of these curricula will be done by offering different fundamental technical courses. A core of academic courses will provide students with English, mathematics, and social science skills.

This program is intended to produce diploma graduates who possess competencies as required by agreement between the participating company and the technical institute. Because the Work-Based Learning Program can be custom-tailored to fit a variety of business and industry needs, its graduates will be prepared for upward mobility or cross training in positions such as technician, operator, mechanics, specialist, or manager in various companies.

BENEFITS

Company benefits include:

- Becoming an integral part of the educational process.
- Producing a well rounded employee with a broad foundation of communicative, mathematical, and interpersonal abilities in addition to occupational skills.
- Promoting employee understanding of overall operation.
- Increasing interdepartmental understanding.
- Customizing training to meet specific company needs and requirements.
- Producing qualified employees for promotion and/or supervisory positions.
- Implementing a system of cross training of employees.
- Providing an apprenticeship type of program.
- Replacing or augmenting existing company training programs.
- Serving as screening and hiring mechanism.
- Offering flexible scheduling allowing day or night classes at company location, or at the technical institute.
- Providing companies with another means of expanding their employee benefit programs by offering tuition reimbursement to employees.
- Offering an opportunity to the worker to acquire skills while earning a wage.

BENEFITS

Technical Benefits Include:

- Creating a full partnership among the technical institute, business and industry, and the community by providing more customized programs.
- Serving as a marketing tool to attract new and expanding industries within the service area.
- Offering more services to business and industry.
- Expanding business, industry, and community awareness of the institution and its capabilities.
- Increasing enrollment.
- Broadening curriculum.
- Implementing state-of-the-art instruction by using equipment, supplies, and facilities provided by the company.
- Utilizing existing courses and facilities.
- Affording the worker an opportunity to acquire technical skills while earning a wage.

BENEFITS

Student benefits include:

- Acquiring excellent preparation for promotion and/or cross training.
- Increasing one's value in the job market by developing a well rounded, broad foundation of communicative, mathematical, interpersonal, and occupational skills.
- Improving one's ability to adapt to changes in the work place (i.e. changes in equipment, technology, management styles, etc.)
- producing better employee interdepartmental understanding and harmony.
- Enhancing one's advancement potential.
- Providing networking possibilities.
- Savings through receiving academic credit for related work experience.
- Savings for student when employee tuition reimbursement is available.
- Reducing time necessary to meet diploma requirements.
- Scheduling flexibility.
- Obtaining technical skills while earning a wage.

ADMISSIONS
(Admission Requirements)

Standard Statement

Statewide admission requirements are implemented for a Work-Based Learning program.

Explanatory Comment

Admission refers to regular admission into a diploma granting program.

Statewide program admission requirements consider state and national occupational licensing and certifying requirements, where applicable.

The institution develops and implements clearly stated diploma program admissions policies and procedures.

Evaluative Criteria

The requirements for admission to the Applied Manufacturing Technology program are:

a) attainment of 16 or more years of age, depending on company requirements.

b) achievement of math, reading and English levels as determined by the general education core competencies required and validated by the admissions test;

c) attainment of high school diploma or GED credentials;

d) employment in an approved job classification with a participating company;

e) recommendation from the participating company;

f) completion of application and related procedures.

ADMISSIONS
(Provisional Admission Requirements)

Standard Statement

Statewide provisional admission requirements are implemented for a Work-Based Learning Program.

Explanatory Comment

Provisional admission is granted to qualified students who do not meet the regular admission requirements of the program.

Provisionally admitted students are allowed to take developmental studies courses and/or certain occupational courses designated in the course sequence standard.

The institution develops and implements clearly stated policies and procedures for entry into diploma programs on a provisional basis.

Evaluative Criteria

Provisional admission to the Applied Manufacturing Technology program is afforded those students who do not meet program admission requirements but who meet provisional admission requirements.

The requirements for provisional admission to the Applied Manufacturing Technology program are:

a) attainment of 16 or more years of age, depending on company requirements.

b) achievement of math, reading and English scores of no less than one level below regular admissions levels as validated by the admissions test;

c) attainment of GED within one year of enrollment;

d) employment in an approved job classification with a participating company;

e) recommendation from the participating company;

f) completion of application and related procedures.

Provisionally admitted students whose English, math, and/or reading achievement levels do not meet regular program admission requirements are required to enroll in

developmental studies courses or an adult literacy program approved by the Georgia Board of Technical and Adult Education.

CREDENTIALS

Name

The Work-Based Learning program will be named "Applied Manufacturing Technology", and graduates will be granted a "Diploma in Applied Manufacturing Technology" certifying satisfactory completion of program requirements.

Warranty

Graduates of the Applied Manufacturing Technology program shall be guaranteed under the Warranty Policy of 1989 through the Georgia Department of Technical and Adult Education. To demonstrate confidence in and commitment to quality technical education programs which are relevant, current, and responsible to the state expectations of Georgia's businesses and industries, the State Board of Technical and Adult Education will warrant every graduate according to the following stipulations:

a) This warranty guarantees that the graduate has demonstrated the knowledge and skills and can perform each competency as identified in the industry-validated curriculum, and any program graduate who is determined to lack such competence shall be retrained at no cost to the employer or employee for tuition or instructional fees.

b) Any claim against the warranty will be based on an agreement between the employer and the technical institute graduate that the individual could not perform one or more of the competencies contained in the industry-validated curriculum.

c) This warranty is included as part of the original tuition cost at all state technical institutes in Georgia and is applicable to graduates of any diploma or degree program who entered the program subsequent to the mandated standards implementation date.

d). The warranty will remain in effect for two consecutive years following the date of graduation and will be honored by any state technical institute which offers the same program.

Transcripts

Students' transcripts will be on file at the respective institutions showing credit earned from institutional and field-based courses.

PROGRAM STRUCTURE

The Applied Manufacturing Technology program utilizes essential course components consistent with statewide program requirements.

The Applied Manufacturing Technology program is assigned a CIP code of 48.9999 and utilizes essential components designated for that program number statewide. Program components include but are not limited to:

a) Program Title

Applied Manufacturing Technology

b) Program Description

The Applied Manufacturing Technology program is intended to produce graduates who are prepared for upward mobility or cross trained in various manufacturing fields. The program acknowledges successful related work experiences by awarding academic credit for these experiences. The program is customized to individual industries to ensure appropriate training. The customizing of these curricula will be done by offering different fundamental technical courses. A core of academic courses will provide students with English, mathematics, and social science skills.

c) Essential Courses

A minimum of 45 credit hours is required for the general and technical fundamental core. Courses are to be selected from any approved State Standard program.

Additionally, the required core courses are to meet the following guidelines:

General Core: 13 credit hours minimum

a. 5 credits Mathematics
b. 5 credits English
c. 3 credits Social Science

Technical Core: 27 credit hours minimum

Elective: 5 credits, with the option of placing the credits in the general core or the fundamental technical core.

Field Based Courses: 20 credit hours (600 contact hours) minimum

Three contact hours of occupational based instruction (OBI) per week for the duration of a quarter equals one quarter credit hour; occupational-based instruction is defined as instruction which emphasizes supervised work experience activities requiring the application of occupational competencies.

d) Credits Required for Graduation

65 minimum quarter hour credits
90 maximum quarter hour credits

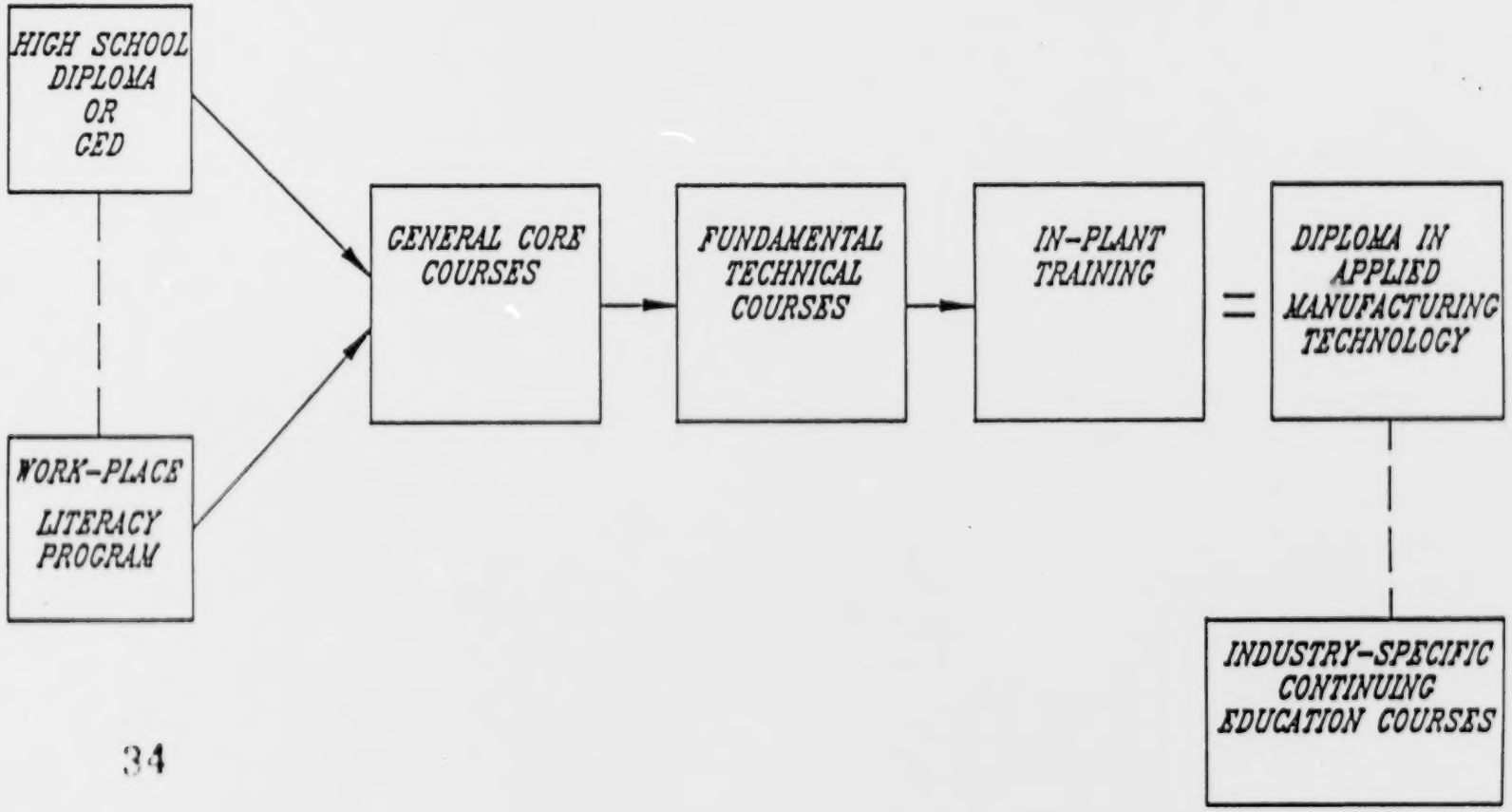
Flexibility in credits for graduation has been allowed in order to customize a program to meet specific company requirements. However, the maximum limit on credits must be adhered to in order to establish a reasonable amount of work in which a student can complete and still be within the guidelines of program standards which state a limit of two years in length.

The 25 credits, from minimum to maximum, may be included as general core, fundamental technical core or field-based courses or a combination of each.

Transferability of courses

All courses are transferable among technical institutes.

WORK-BASED LEARNING PROGRAM



FINANCIAL CONSIDERATION

Application Fee:

Students will pay a $15.00 non-refundable application fee, which includes the cost of the initial entrance test for diploma-bound students.

Tuition:

Students who enroll in general course and/or fundamental technical courses regularly scheduled, on campus, by the institution will pay the prevailing tuition/supply fee.

Fees for general core and/or technical fundamental courses for which special arrangements are made with a specific company are to be negotiated.

Fees for industry-based instruction will be negotiated between the company and the institution, and shall be based on the administrative and/or supervisory tasks performed by institutional personnel (i.e, visits by internship specialist, registration, grade assignments and/or recording on transcripts).

Books:

Each student and/or company will be required to purchase books required for specific courses. Costs will be determined at time of enrollment.

Other Fees:

When enrolled in institution based courses (on-campus), students will pay other prevailing fees, (i.e., activity fee, parking, etc.)

Student Accident Insurance:

Students will be offered the opportunity to purchase accident insurance. Participation in the insurance program will be optional, unless it is automatically included in other activity fees that are required when students are enrolled in on-campus classes.

Financial Aid:

Students enrolled in the Work-Based Learning Program will be permitted to apply for financial aid. Considering the potential variety of employers participating in a Work-Based Learning Program, it is recommended that the decision on who will pay fees, and how, be resolved when establishing the program.

COMPANY REQUIREMENTS

The major idea of work based learning is the cooperative effort between an industry and a technical institute, sharing the educational efforts leading to recognize credentials for an employee.

Field Based Course:

a) Documentation of work - The program allows for a minimum of 20 credit hours being awarded for on-the-job performance by the employee. During planning conferences held between company and institutional personnel, a format will be devised for use in documenting competencies/tasks to be performed by the students, and an estimated time to be spent on each area.

   The competency/tasks listing will serve as the guideline for determining the amount and/or requirements for awarding credit through a Field Based Course.

b) Validation of Competency Completion - An identified industry person will use a Documentation of Work form and validate that the student has performed the identified competencies/tasks.

c) Evaluation of Performance - An identified industry person will use a Documentation of Work form and assess the quality of the student's performance.

APPROVED TECHNICAL COURSES
STATE OF GEORGIA

General Core Courses		Credits
ECO 191	Principles of Economics	5
ENG 100	English	5
ENG 101	English	5
ENG 102	Technical Writing	5
ENG 191	Composition and Rhetoric	5
ENG 192	Technical Communications	5
MAT 100	Basic Mathematics	3
MAT 101	General Mathematics	5
MAT 103	Algebraic Concepts	5
MAT 104	Geometry and Trigonometry	5
MAT 191	College Algebra	5
MAT 193	College Trigonometry	5
MAT 195	Calculus and Analytic Geometry	5
PHY 191	Physics I	5
PHY 192	Physics II	5
PHY 291	Physics III	5
PSY 100	Interpersonal Relations and Professional Development	3
PSY 191	Introductory Psychology	5
PSY 192	Industrial Organizational Psychology	3

APPROVED TECHNICAL COURSES
STATE OF GEORGIA

Fundamental Technical Courses		Credits
ACT 100	Refrigeration Fundamentals	4
ACT 101	Principles and Practices of Refrigeration	7
ACT 102	Refrigeration Systems Components	7
ACT 103	Electrical Fundamentals	8
ACT 104	Electric Motors	3
ACT 105	Electrical Components	5
ACT 106	Electric Control Systems and Installation	4
ACT 107	Air Conditioning Principles	6
ACT 108	Air Conditioning Systems and Installation	3
ACT 109	Troubleshooting Air Conditioning Systems	7
ACT 110	Gas Heating Systems	5
ACT 111	Electric Heating Systems	3
ACT 112	Heat Pumps	3
AMF 101	Electrical Fundamentals I	4
AMF 102	Electrical Fundamentals II	4
AMF 105	Hydraulic and Pneumatic Principles	2
AMF 106	Introduction to Robotics	4
AMF 107	Machine Tool Numerical Control Theory and Practice	3
AMF 110	Introduction to Active Devices and Circuits	4
AMF 111	Introduction to Digital Logic	4
AMF 113	Programmable Controllers I	4
AMF 201	Analog Circuits	4
AMF 203	Applied Mechanisms	2
CIS 191	Computer Programming Fundamentals	5
CMP 101	Introduction to Microcomputers	3
DDF 191	Engineering Graphics	3
EET 101	D.C. Circuit Analysis	5
EET 102	A.C. Circuit Analysis I	5
EET 103	A.C. Circuit Analysis II	5
EET 105	Electronic Devices	5
EET 201	Digital Fundamentals	4
EET 202	Semi-Conductor Circuit Analysis	5
EET 203	Digital Applications	5
EET 204	Linear Integrated Circuits	5
EET 205	Communication Systems	4
EET 206	Microcomputer Applications	5
ELC 103	Introduction to Electronics Technology	2
ELC 104	Soldering Technology I	1
ELC 106	Direct Current Circuits I	4
ELC 108	Direct Current Circuits II	7
ELC 109	Alternating Current I	7
ELC 110	Alternating Current II	7
ELC 111	Electronics Microcomputer Applications I	3

Fundamental Technical Courses		Credits
ELC 112	Electronics Microcomputer Applications II	3
ELC 114	Solid State Devices I	7
ELC 115	Solid State Devices II	4
ELC 116	Soldering Technology II	1
ELC 117	Linear Integrated Circuits	7
ELC 118	Digital Electronics I	7
ELC 119	Digital Electronics II	7
ELC 120	Microprocessors I	7
ELC 121	Microprocessors II	4
ELC 122	Microprocessors Interfacing	7
ELC 123	Communications Electronics Survey	7
ELC 124	Industrial Electronics Survey	4
ELD 101	Introduction to Electrical Distribution	6
ELD 102	Safety for Electrical Distribution	6
ELD 103	Fundamentals of Electrical Distribution	6
ELD 104	Electrical System Maps, Schematics, and Symbols	2
ELD 105	Wiring for Electrical Distribution	3
ELD 106	Powerline Construction, Maintenance, and Repair	7
ELD 107	Transformers	6
ELD 108	Underground Residential and Commercial Distribution	5
ELD 109	Advanced Electrical Distribution	5
ELT 101	Safety	2
ELT 102	Electricity Principles	9
ELT 103	Residential Wiring I	4
ELT 104	Residential Wiring II	4
ELT 105	Residential Wiring III	3
ELT 106	Electrical Prints, Schematics, and Symbols	3
ELT 107	Commercial Wiring I	4
ELT 108	Commercial Wiring II	4
ELT 109	Commercial Wiring III	4
ELT 111	Single Phase and Three Phase Motors	5
ELT 112	Variable Speed Controls	7
ELT 118	Electrical Controls	7
EMT 201	Electromechanical Devices	5
EMT 202	Control Systems	4
EMT 203	Programmable Controllers	5
IMT 101	Industrial Maintenance Safety Procedures	4
IMT 102	Hand and Portable Power Tools	3
IMT 103	Blueprints and Schematics	4
IMT 104	Basic Troubleshooting Techniques	4
IMT 106	Alternating Current Circuits	4
IMT 108	Elements of Mechanics	4
IMT 110	Applies Mechanics I	4
IMT 112	Mechanical Troubleshooting I	1
IMT 113	Hydraulics I	4
IMT 115	Pneumatics I	4
IMT 118	Introductory DC and AC Motors	4

Fundamental Technical Courses		Credits
IMT 119	Motor Control I	4
IMT 120	Motor Control II	4
IST 103	Instrument Measuring Principles I	7
IST 104	Instrument Measuring Principles II	7
IST 105	Instrumentation Electronics	3
IST 106	Electronic Instrumentation Maintenance	3
IST 107	Control Valves and Actuators	3
IST 108	Introduction to Programmable Logic Controls	3
IST 109	Control System Analysis	7
IST 110	Instrumentation Microprocessors	7
IST 111	Distributed Control Systems	2
MCH 101	Blueprint Reading I	5
MCH 103	Blueprint Reading II	5
MCH 105	Machine Tool Theory I	4
MCH 106	Laboratory practice I	5
MCH 107	Machine Tool Theory II	5
MCH 108	Laboratory Practice II	5
MCH 109	Machine Tool Theory III	5
MCH 110	Laboratory Practice III	5
MCH 112	Laboratory Practice IV	5
MCH 114	Machining Math I	5
MCH 115	Characteristics of Metals/Heat Treatment I	5
MCH 118	Computer/CNC Literacy	5
MET 101	Engineering Materials	5
MET 201	Manufacturing Processes I	4
MET 202	Manufacturing Processes II	4
MET 203	Statics	5
MET 204	CAD I	4
MET 205	CAD II	4
MET 208	Strength of Materials	5
MET 209	Machine Design	4
WLD 100	Introduction to Welding Technology	6
WLD 101	Oxyfuel Cutting	4
WLD 102	Oxyacetylene Welding	1
WLD 103	Blueprint Reading I	3
WLD 104	Shielded metal Arc Welding I	6
WLD 105	Shielded Metal Arc Welding II	6
WLD 106	Shielded Metal Arc Welding III	6
WLD 107	Shielded Metal Arc Welding IV	6
WLD 108	Blueprint Reading II	3
WLD 109	Gas Metal Arc Welding	6
WLD 110	Gas Tungsten Arc Welding	4
WLD 112	Preparation for Industrial Qualification	4

SOUTHWIRE COMPANY

DIPLOMA IN APPLIED MANUFACTURING TECHNOLOGY

WITH CONCENTRATION IN

- SUPERVISION
- MANUFACTURING
- COPPER REFINING
- MACHINE TECHNOLOGY

ADMISSION REQUIREMENTS

REGULAR ADMISSION	PROVISIONAL ADMISSION
High School or GED	One grade below base competency
Base Competency Math 8th grade English 9th grade Reading 9th grade	Must take developmental studies High school or GED must be completed before graduation

Competency level determined by Carroll Technical Institute admission test

APPLIED MANUFACTURING TECHNOLOGY

CONCENTRATION IN SUPERVISION

GENERAL CORE	TITLE	CREDIT HOURS	CONTACT HOURS
ENG 101	English	5	50
MAT 101	General Math	5	50
ENG 102	Technical Writing/ Technical Communications	5	50
PSY 100	Interpersonal Relations & Professional Development	3	30
CIS 102	Introduction to Computers	5	70
		23	250

FUNDAMENTAL TECHNICAL	TITLE	CREDIT HOURS	CONTACT HOURS
MKT 101	Principles of Management	5	50
MKT 104	Principles of Economics	5	50
MSD 101	Interpersonal Employee Relations	5	50
MSD 103	Leadership & Decision Making	5	50
MSD 106	Counseling & Disciplinary Actions	5	50
IMT 101	Industrial Safety Procedures	4	50
IMT 104	Basic Troubleshooting	4	50
		33	350

PHASE I & II CLASSES

AT SOUTHWIRE

ON COMPANY TIME

DAY AND NIGHT

FIELD BASED STUDY

600 Contact Hours

20 Credit Hours (To include MSD 108 Management and Supervision Lab)

Subject Matter Experts

- Plant/Department Managers
- Corporate Professionals

Content Anchors

- Quality Education System
- Statistical Process Control
- Supervisor as a Trainer
- Dale Carnegie Course
- Others...

Total Credits: 76

Total Contact Hours: 1200

PHASE III CONTACT HOURS

EVALUATION BY MANAGERS

COMPLETE ASSIGNED PROJECTS

CREDIT FOR PAST TRAINING

PROGRAM COST

PAID BY SOUTHWIRE

WAGES ON DAY OFF